

Investments in Health Contribute to Economic Development

Contributions of Health to Economic Development

Health is central to economic development and is one of the key components to a sound development strategy, along with investments in education, economic development, and good governance. The recent Report of the Commission on Macroeconomics and Health notes that there are three main ways that disease may actually *impede* the process of economic development (85). First, disease can slow economic development by direct means, when avoidable disease causes early death and chronic disability to workers, with tremendous economic losses to society. Second, disease can also have an impact on parental investment in children, as high rates of infant and child mortality cause parents to maintain high fertility rates to ensure the survival of some children; as a consequence, parents may be less able to invest in the health and education of all their children. Third, high prevalence of disease in a society has a dampening effect on a whole range of industries (such as agriculture, mining, manufacturing, tourism) and a depressing effect on infrastructure investment. This could also impact domestic and foreign investment. Thus, the presence of avoidable disease and disability in a society can have a negative impact on economic growth that



is costly in economic terms, and prevents the improved well-being of society.

New research supports the premise that health improvements in societies stimulate economic growth and promote human progress. Improved health contributes to greater income through at least four mechanisms

Health is a key component of economic development.

identified by researchers (15). First, the channels for health improvements may be primarily through direct means,

when control of avoidable disease results in higher labor productivity of workers. Second, there is also clear evidence that health improvements result in increased

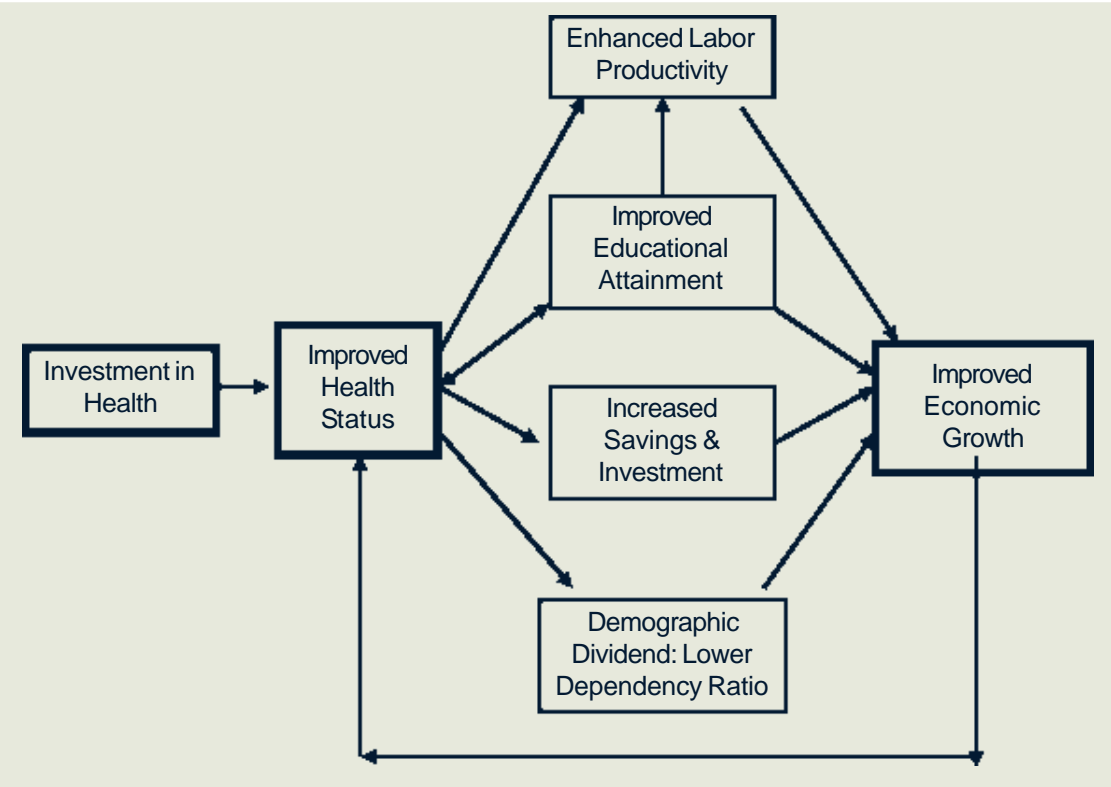


learning, with good health contributing to school attendance and better educational performance; eventually, this translates into greater productivity of a more educated workforce. Third, there are important “spillover effects” to society, as workers with improved health live longer and increase their savings and investment to prepare for retirement. Fourth, as mortality and fertility decline, countries may benefit from the “demographic gift” that occurs when a country transitions to an increase in the proportion of the working age population supporting fewer dependents. This “gift” may cause dramatic increases in income per capita, although this only occurs when a favorable policy environment has provided for new, educated workers to be readily incorporated into the job market (16).

Figure 1 illustrates the complex pathways in which health contributes to economic development. One recent study concluded it is more likely for countries to experience

virtuous cycles of economic development, or positive economic growth cycles, if they first experience virtuous cycles in human development, such as improvements in health status (59). At the country level, health status is an important marker of economic development as measured by life expectancy or other health indicators; in many respects, initial health of a population seems to be a better predictor of subsequent economic development than is initial education (12). Most cross-country studies of the important contribution of human capital to economic development have focused fairly narrowly on the role of education; however, there is an extensive microeconomic literature that views human capital in a wider context, incorporating work experience and health status, in addition to years of schooling (15). Health has been shown to be a cause of higher income, as improvements in health status have direct positive effects on aggregate output for countries, and improvements in health also have

Figure 1: Relationship between Investment in Health and Economic Development



additional effects on greater savings and capital accumulation. (15). Health has also been shown to be an effect of higher income, as increases in a country's income will tend to raise health status (58). This *dual* relationship between health and higher income needs further research to clarify the causality in the relationship (75). There are clear links between global health issues and economic interests, although research to date has concentrated on how health issues positively or negatively impact on a country's economy (43).

At the individual level, there is new scientific evidence establishing much stronger and more numerous links between health and nutrition of children in the early years of life and their subsequent health status as adults (10). This evidence has shown that infants and children who suffer from poor health are more likely to develop a wide range of chronic conditions in adulthood. At the household level, improved health of adults corresponds to lower mortality and morbidity and increased earnings. It is also known that there are important multigenerational effects of good health and nutrition; girls who were healthy as children tend to give birth to children who are healthy, with adequate birth weight, whereas girls who were poorly nourished as children tend to give birth to low birth weight babies (29).

Improved Health, Nutrition, and Labor Productivity

There has been considerable progress in documenting a causal impact of health on wages and productivity in developing countries (66; 15). A very strong relationship links economic development to improved nutrition, both directly, through the effect of improved nutrition on labor productivity, and indirectly, through the effect of improved nutrition on greater life expectancy (7). Recent studies in a number of countries in Latin America show that height increases from better nutrition in childhood correspond with increased adult earnings,

although the association between adult health and adult wages may be variable (60). Adults with better health and nutrition tend to have high productivity, less absenteeism from work, and higher incomes than those with poor health; consequently, the association between adults' health status and economic well-being is at least as strong as the widely recognized association between education and economic well-being (75). Improved health also increases income growth by fostering greater economic participation of women (50). These recent studies build on earlier evidence that disease can impede investments that date back many years; these include the example of the devastating impact of malaria and yellow fever on the construction of the Panama Canal in the late nineteenth century (Box 1).

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The health of a population, and the role of human capital, is very important in terms of contributions to technical progress leading to long-term economic development (12). Recent analysis has yielded findings of a strong social gradient in health in many countries. In developing countries, the poor are more likely to suffer from severe health problems than people from higher income levels. At the same time, the poor are also more likely to work in jobs that rely on strength and good health to earn an income. It has been suggested that the wage variations that result from ill health among the poor are significant (66). When poor workers become ill, they face a reduction in income from the costs of medical treatment; loss of income during the illness; loss of potential earning power from frequent illness in childhood; and loss of future earnings from disability or premature mortality (85).

Box 1. Impact of Health and Nutrition on Labor Productivity

Malaria, labor productivity, and the construction of the Panama Canal

- ▲ Between 1882 and 1888, an estimated 10 thousand to 20 thousand laborers died from malaria or yellow fever in the attempt to construct the Panama Canal. The project had to be abandoned, at an economic cost estimated to be about \$30 million.
- ▲ Only after malaria and yellow fever were brought under control in the early twentieth century were subsequent laborers able to complete construction in 1914 (85; 28).

Anemia and labor productivity in Indonesia

- ▲ Studies suggest a causal effect of iron deficiency on reduced work capacity.
 - △ A longitudinal field study of nearly 400 male rubber tree tappers and weeders in Indonesia showed that baseline productivity among the anemic was about 20 percent lower than the productivity of non-anemic workers.
 - △ Results suggest that the output of workers who suffered from iron deficient anemia was raised by around 20 percent through supplementation, a very large effect (68).

Height and wage earnings

- ▲ Studies indicate that health status, measured by adult height, is a notable determinant of adult productivity (60).
- ▲ There are now numerous studies supporting the fact that height has a positive impact on hourly earnings, probably as a result of cumulative health investments from prenatal care through early childhood (66; 48).

New Lessons on the Importance of Health to Economic Growth from Europe and East Asia

There is new understanding of the contributions that improved health and better nutrition have made to European economic growth and development over recent centuries.

Public health improvements, and family planning programs led to reduction in child and infant mortality and fertility rates; families with fewer dependents saw their incomes rise...

Intensive historical analysis of factors contributing to growth paths of 10 industrialized countries over 100 to 125 years found that improvements in health enhanced human capacity and increased the pace of economic development by 30 to 40 percent (8). Several facets of health were explored in the analysis, including life expectancy at birth; life expectancies at ages five, 10, 15, or 20 years;

and adult stature, as a reflection of long-term nutritional and health status. Previous economic research has focused primarily on economic change following World War II. By studying earlier data from industrialized countries from the nineteenth and early twentieth centuries, the impact of long-term effects from improved health on economic growth is more easily discernible. The conclusions from this research support the view that investments in public health, improved nutrition, and advances in controlling disease have significant “growth enhancing” effects for economies (8).

Nobel Prize winner Robert Fogel has analyzed the complexity of the impact of improved nutrition on long-term economic growth. Advances in biomedical sciences, such as the discovery of a synergy between infections and malnutrition, allow for a more accurate assessment of the impact of improved nutrition on economic growth. He estimates that the combination of improvements in the composition of diets, reductions in infectious disease, along with improved living standards and environmental health initiatives, resulted in



increased labor force participation by the poorest members of society and increased worker output that appears to account for about 50 percent of British economic development since 1800 (24). This means that improved labor productivity was actually one of the principal sources of long-term economic growth in Britain, and in other industrialized countries. This estimate is actually considered to be a low one, as it does not include calculations on the increased efficiency in investments in education, as children with better nutritional and health profiles experienced improved learning outcomes. These findings have implications for including attention to health and nutrition with other investments in developing economies.

Analysis of the East Asian economic development during the 1990s has identified health improvements as a major pillar upon which this growth was based, accounting for as much as one-third of the region's "economic miracle" (16). As public health improvements were introduced into East Asian countries, child and infant mortality declined, and family planning programs brought about fertility reduction. As the large cohort of dependents moved into working age, they were supporting far fewer dependents than in the past, prompting a rise in income per capita.

Infectious Disease Burden is High in Developing Countries

The World Health Organization defines "infectious disease" as all communicable diseases, and some forms of respiratory infections and diarrheal diseases; they are the world's "biggest killers" of children and young adults (87). Estimates are that at least 15 million people a year die from infectious diseases; of these, about 5 million are children under five (82). It is important to note that only six infectious diseases together account for half of all premature deaths; these deadly infectious

diseases are pneumonia, tuberculosis (TB), diarrheal diseases, malaria, measles, and HIV/AIDS (87). In addition to causing early deaths in children and young adults, infectious diseases are also implicated in morbidity, or illness and disability, with significant impact on the growth and development of children, and the ability of adults to work or care for children. There are many challenges to reducing the threat of infectious diseases, including the emergence in recent years of new threats, such as HIV/AIDS; the emergence of strains of disease that are drug resistant, such as with TB; and the resurgence of long-standing threats, such as malaria (64).

The burden of infectious disease is much greater for developing countries, with far greater impact on social and economic development than in industrialized countries. In fact, the disparities in lifespans between developing and industrialized countries is in large part attributable to deaths from infectious disease. The case of pneumonia provides a dramatic example: 99 percent of pneumonia deaths in children occur in developing countries, while child death from pneumonia is a rare event in industrialized countries (87). The impact of measles, a major childhood killer in developing countries, is largely controlled in industrialized countries through vaccination; measles mortality in developed countries is also rare due to good nutrition among children (82). There are many reasons for the devastating impact of infectious disease, among them poverty and social inequality, as infectious disease can be particularly deadly when poor children are already weak from malnutrition; poor environmental conditions in developing countries, with constant threat to children and adults of infection from poor sanitation, lack of hygiene, and unsafe drinking water; demographic changes, such as rural to urban migration in developing countries, that aggravate the spread of infectious diseases; lack of rapid access to treatment from health



services; low immunization coverage for the many infectious diseases that could be prevented by low-cost and effective vaccines; war, unrest, refugees, and famine are all implicated in the emergence of infectious disease (64).

In addition to its impact on mortality, infectious disease is a significant source of morbidity and disability in developing countries. In fact, WHO believes repeated illness and disability to be a major cause of underdevelopment, due to the economic cost of lost working days, treatment, and impact on household poverty (87). Infectious disease can cause repeated episodes of severe illness, and can result in pain, suffering, and handicaps that decrease ability throughout the lifespan. Examples of disability are numerous: measles infection may result in serious impairment such as blindness, deafness, or other conditions that have a long-term negative impact on child growth and development; parasitic infections that are widespread in developing countries may cause intense physical suffering and social and psychological damage, preventing adults from working and sometimes making them social outcasts; many infections cause severe physical deformities that result in social rejection; and sexually transmitted infections and their complications are among the top 20 causes of infectious disease burden (87). In short, infectious disease creates significant obstacles that keep people in poverty, inhibiting productivity and economic growth.

Importance of Education to Labor Productivity

The importance of investing in education as a contributing factor towards development of a country's economy has been well established. Education of a country's citizens builds human resource capacity, enabling people to meet the challenges of the new technology and information age. In many respects, education has been considered the foundation for economic and social well-being, and the key

to increasing economic productivity and establishing social cohesion (81). Poverty reduction efforts in developing countries place an emphasis on the pivotal role of education in improving economic development, and international Millennium Development Goals have been established for monitoring improved access to education, including access to education for girls, and education completion rates (71).

Synergies between Improvements in Health and Education

There appear to be synergies between improvements in health and education, and their combined impact on economic development is greater than the sum of individual contributions from each sector. Policies that address nutritional deficiencies and health care needs are critical to

make investments in education more efficient; well-trained workers are better able to escape intergenerational poverty traps (29; 14). Healthy, well-nourished children are able to develop cognitively, physically, psychologically, and socially (87); all of these factors contribute to improved school performance once children enter school. Special programs to keep poor children in school by providing scholarships or other forms of financing may not be enough for the poor to break out of the poverty cycle; provision must also be made for improvement of health and nutrition of the poor so that they can participate in education, and achieve optimal gain from education initiatives (29).

...Educational achievement and health are linked: policies that address nutrition and health care needs allow vulnerable populations to escape poverty through training and education...

Many of the studies that show educational returns to investment may in fact be somewhat inflated (at least to a modest degree) when they fail to control for health status (60). The link between health and education is one of the important ways in which health contributes to long-term economic development.

Better Health is Critical for Educational Success for Poor Children

There is a need to include health, along with education and other investments, in an integrated approach to improving a country's development. Prior to entering school, poor children are more likely to suffer from infectious diseases than are children from richer income levels, and they are less likely to have access to health services to be treated for illnesses; poor children are less likely to receive immunizations that prevent the childhood cluster of diseases than are children of richer income levels (38). As a result of illness, poor children are more likely to enroll in school late for their age and may suffer frequent absences; late enrollment in school is associated with low educational attainment, including grade repetition and dropout from school (79). Recent scientific evidence has accumulated on the importance of healthy early child growth and development for improving the transition into formal education and longer-term education outcomes (51). A minimum level of health may be necessary for poor children to succeed in education. In urban areas, poor children may also be contributing to the support

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of the family at an early age, often by working in the informal economy; children who work in the street, or live and work in the street, are vulnerable to trafficking, exploitation, and health hazards related to child labor, and will likely have difficulties attending school.

Experience has shown that income subsidy programs targeted towards poorer families that provide incentives to remain in school, and are also linked to improving the health and nutrition of children, are a cost-effective means of reducing child labor, encouraging school attendance, and improving nutritional status of children (20). Such programs are intended to complement formal sectoral efforts to improve social services.

Improved Nutrition Leads to Better Educational Attainment for Poor Children

The effects of poor nutrition in children are well established (87). Chronic under-nutrition during infancy and early childhood has been shown to have significant adverse effects on cognitive development and school performance (56). There is less clarity over the issue of timing of early childhood malnutrition on subsequent school performance; a recent study has proposed that the period from 18 to 24 months of age may be critical (34). It is known that if a child experiences stunting before the age of two, there is little possibility of reversing this later; inadequate complementary feeding is the most important factor leading to stunting (32). Specific deficiencies of micronutrients essential to human development, such as iodine and iron, are also correlated to impaired behavioral and cognitive development (56). Anemia is known to impair psychomotor development, slow physical activity, lower resistance to infection, and, among infants, adversely affect survival (21). An extensive review of studies on anemic children older than two years concluded that these children had poorer cognition and school achievement than non-anemic children (35). Intestinal parasites are generally a contributing factor in anemia, and must also be addressed (21). Joint treatment of iron deficiency and parasites has been shown to positively impact physical and mental development in preschool children (65). Box 2 summarizes the link between health and nutrition.

Box 2: The Link between Health and Nutrition

- ▲ Most children die from a few causes, mainly diarrhea, acute respiratory infections, measles, and malaria, with malnutrition contributing to these deaths through undernutrition, poor growth, and micronutrient deficiencies (32). Reducing infant and child mortality can be accomplished through Integrated Management of Childhood Illness and improved immunization (87).
- ▲ The nutrition of mothers and children can be improved through prenatal health and nutrition services that include weighing, counseling, and food supplements to address low birth weight; growth monitoring; promotion of and counseling on healthy feeding practices for mothers of young children; and supplementation of needed micronutrients (such as vitamin A, iron, folic acid, and iodine through iodized salt), along with communication and education for behavior change (32).

The Economic Costs of Poor Health

At the country level, the disease burden slows economic development, and the costs of avoidable disease to society, families, individuals, and economic development can be enormous (85). Public health achievements, including reducing infant and child mortality, control of infectious disease, and increasing life expectancy are important factors in raising productivity, reducing poverty, and succeeding in achieving sustained economic growth, in addition to their intrinsic value as important humanitarian aims (74). Adult survival rates have been shown to have a significant effect on economic development for low-income countries (50). One clearly documented example is that countries that have eliminated malaria have experienced substantially higher economic development than neighboring countries in the

five years after eliminating the disease; it is estimated that malaria has a large impact on economic growth through many direct and indirect effects (28).

Diseases such as HIV/AIDS pose an enormous economic burden and contribute to slowing the pace of economic growth in many countries of sub-Saharan Africa, with potential to do so in countries in Asia and Eastern Europe (16). The income losses to families is especially daunting, as most of the mortality and illness affects workers in prime working years. One U.N. study estimated HIV/AIDS would cost the Cambodian economy \$2 billion by 2006 (67). Much of this economic decimation results from a huge decline in labor force (90 percent of Cambodia's AIDS cases are between the ages of 20 and 49 years of age). Losses are therefore not limited to any one sector as a result – the country will likely see a significant decline in the production of export crops, weakening the Cambodian agricultural sector and reducing foreign capital flow (67). The costs of detection and treatment are high, and decrease resources to address other health burdens. Combating HIV/AIDS requires an approach that calls on leadership and innovation, in addition to integrated prevention and treatment (74).

Whether infectious disease is re-emerging or a new threat, it is apparent that the effect on a country's national trade and tourism can be significant:

- ▲ India lost \$1.7 billion in tourist income and trade weathering the bubonic plague outbreak of 1994;
- ▲ Bovine spongiform encephalopathy (BSE or “mad cow disease”) saw the combined direct and indirect losses of \$3 billion to the United Kingdom in 1997;
- ▲ Peru lost \$770 million in seafood exports during their 1991 cholera outbreak;



- ▲ The Severe Acute Respiratory Syndrome (SARS) epidemic is likely to have depressed economic growth in developing Asia by 0.1 to 0.2 percentage points in 2003 (82).

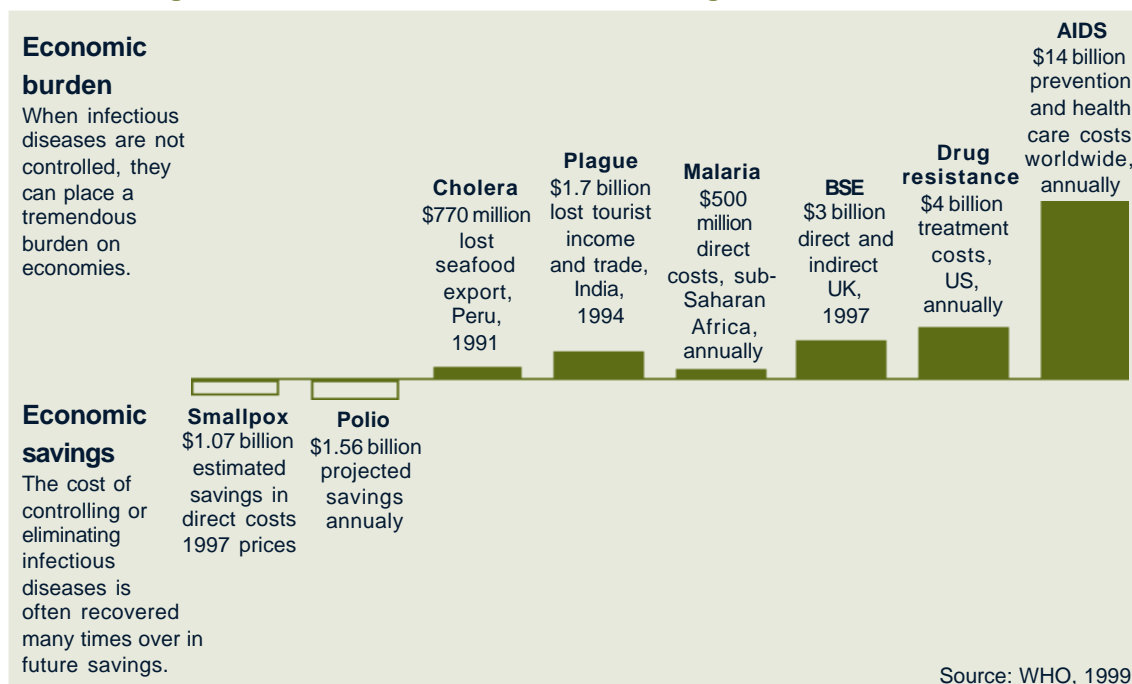
Figure 2 illustrates the economic burden of infectious disease, and estimated savings from controlling or eliminating smallpox and polio.

Addressing Poverty Reduction and Health Inequality

Information has emerged on the health conditions of the poor in many countries, from detailed analyses of national level data, Living Standards Measurement Surveys, and Demographic and Health Surveys (87; 76; 38). It is now possible to compare the health status of different income groups, for a better understanding of the gap between the health status of the poor and the health status of the rich; this is an improvement over relying on

country averages, as averages tend to mask differences across income levels (38). By learning about differences in health status according to income level, it is possible to develop a more complete picture of poverty and health. Traditionally, poverty has been defined in economic terms only, without consideration of health status, and health has been seen as a service to be delivered to those who are poor (38). The new analysis provides a clearer illustration of the significant variation in the burden of death and disease among the poorer and the richer segments of societies. For example, among the global poor, communicable diseases are the leading causes of death, with respiratory infections and diarrheal diseases in children each causing more than 10 percent of total deaths, and perinatal conditions and the childhood cluster of diseases (pertussis, polio, diphtheria, measles, and tetanus) each responsible for almost 8 percent of deaths; the rich bear only a small percentage of the communicable disease burden of death and disease (39).

Figure 2: Economic Burden, Economic Savings of Infectious Disease





Evidence has also emerged of other inequalities in the use of health care services, and in spending on health services. Data from eight developing countries and countries in transition showed that rich groups have a higher probability of obtaining care when sick, are more likely to be seen by a doctor, and have a higher probability of receiving medicines when ill than do poorer groups (47). This evidence calls for formulating policy goals with specific attention to health problems of the poor, to reduce differences between the poor and other groups (38). This will contribute to lowering the economic costs of poor health, and reducing relative poverty; other policy and program measures will be needed for a complete approach to ensuring more equitable welfare distribution in society and greater participation by the poor in economic opportunities.

The poor who live in slum areas of cities are often neglected when it comes to provision of services, so that the health status of slum dwellers may be worse than the health status of other urban dwellers and of the rural population. Environment-related diseases can be a significant cause of premature death and recurrent and long-term disability among poor children in urban areas of developing countries. One recent estimate is that up to 60 percent of acute respiratory infections (ARIs) and up to 90 percent of diarrheal diseases are associated with environmental causes (46). In a literature review relying on statistical evidence of child health conditions in urban slums in the Asia/Near East region, mortality and morbidity rates for children under five were much higher in urban slums than national rural averages (26).

- ▲ In Ahmedabad, India, infant mortality rates in slums are twice as high as national rural averages, with children suffering from diarrhea, ARIs, and greater nutritional wasting than in rural areas. The primary reasons for poor health status included immunization rates that were half those of rural children; higher frequency of cases of diarrhea, with children receiving oral rehydration therapy half as frequently as in rural areas; pregnant women receive less antenatal care and fewer preventive immunizations than rural women; and poor environmental conditions.
- ▲ In Manila, Philippines, infant mortality rates of slums are triple those of non-slum areas; in addition, there is high incidence of TB, diarrheal disease, severe malnutrition, and parasitic infections among children.
- ▲ Although data for urban slum conditions is difficult to obtain for Cairo, Egypt, it appears that infectious disease, diarrhea, ARIs, parasites, and the proportion of malnourished children are all considerably higher in slum areas as compared to the city as a whole.

In the Asia/Near East region, cities are experiencing rapid growth rates, with the fastest growth rates occurring in illegal squatter settlements at the edge of cities (26). Although health services may be available in urban areas, there may be large underserved populations among the squatter settlements; a comprehensive approach to addressing health, nutrition, and sanitation needs must include these vulnerable populations.

Health System Strengthening to Improve the Health of the Poor

High Impact, Cost-Effective Health Interventions

There are proven cost-effective health interventions that can result in significant improvement of health status. Immunizations against specific diseases are the most effective way to reduce disease and death (82). Low-cost health interventions for infectious disease control include a range of simple and effective approaches, such as the Integrated Management of Childhood Illnesses (IMCI), with combined therapy to address multiple illness from which children suffer, and a focus on prevention; full childhood immunization against diphtheria, pertussis, tetanus, polio, measles, and TB; Directly Observed Treatment, Short-course (DOTS) for detection and combined treatment of TB with inexpensive drugs; bednets impregnated with insecticide for malaria prevention; availability of essential drugs; prevention strategies for HIV/AIDS; iron supplementation for anemia; and effective health education (87).

▲ Use of DOTS has been demonstrated to be effective in different settings in developing countries. In Peru, TB incidence was almost halved between 1991 and 1999; in Bangladesh, the DOTS strategy has been applied by the Bangladesh Rural Advancement Committee and has achieved an 87 percent cure rate in a community-based TB program; in Nepal, where the DOTS strategy was extended to 75 percent of the population, the number of deaths from TB declined precipitously (83).

▲ Viet Nam reduced malaria deaths by more than 97 percent between 1992 and 1997, through widespread use of insecticide-treated nets, indoor spraying with insecticides, and the use of effective, locally produced drugs (83).

▲ Thailand's "100 percent Condom Campaign" targeted high-risk commercial sex workers and brothel owners, to promote widespread condom use in sex encounters to prevent spread of HIV/AIDS; more than 90 percent of sex encounters now involve condoms and rates of HIV infection have fallen, as have rates of sexually transmitted disease (83).

Public health programs need to focus on conditions and interventions to reach the poor to improve their access to essential health services (85). This requires attention to health system strengthening to improve service delivery. There has been considerable focus recently on improving the performance of health systems through better government stewardship in developing the policy responses to the health challenges of each country, improving quality of care in service delivery, ensuring balance in resource generation for health systems, and improving health system financing, particularly through prepayment schemes focused on improving health access for the poor (86).

Research is currently underway to monitor health systems strengthening strategies, to better understand how different strategies affect the design, balance, and implementation of policy, program, and interventions that result in improved health for the poor (40). This requires developing tools to monitor and evaluate common health systems strengthening strategies. Development of an evidence base is a fundamental step towards designing effective protection mechanisms, such as fee waivers or a solidarity fund, to improve utilization of services among the poor. For example, a household

...interventions exist to prevent and treat the conditions responsible for a high proportion of the health conditions of the poor; however, public health programs need to focus on conditions and interventions to reach the poor to improve their access to essential health services (WHO Commission on Macroeconomics and Health, 2001)

survey conducted in Mali, where the health sector has undergone continuous reform since 1989, looked at demand for health services and supply of basic health services. Findings from the survey included key information to develop interventions to protect the poor from financial obstacles; specifically, that these interventions need to be targeted to specific groups for specific priority services, and that income obstacles affected genders and geographic populations differently for a wide range of priority services (30).

Cost Savings of Eliminating Disease

Infectious disease can be brought under control, with political commitment, a health care system to deliver services, and public demand for action. The costs of implementing treatment programs for the population can be far less than the economic costs of poor health due to disease. At the household level, loss of income and medical expenses can have catastrophic effects resulting in loss of assets, greater impoverishment, and foregone investment in education of children, who are pulled out of school and put to work as child laborers to contribute to household income. A recent study measuring the burden of disease and economic consequences of tuberculosis in the Philippines estimated the loss in wages to the country annually from TB to be approximately \$142 million (55). Furthermore, \$485 million per year are estimated to be lost in foregone income because of premature TB deaths in the country. The Philippines report estimated treatment costs (including cost of TB drugs, physician fees, and lab tests) for the entire affected population to be approximately \$9 million – a mere fraction of the total economic losses. A recent review of the impact of a revised Tuberculosis Control

Program in India found that the program has been successful at improving access to care, quality of diagnosis, and likelihood of successful treatment, thereby preventing 200,000 deaths, with indirect savings of more than \$400 million, or more than eight times the cost of implementation (41).

Recent global initiatives to address infectious disease have emerged, with growing political momentum for their support. These are aimed at enhancing global response capacity to disease, improving global surveillance of infectious disease, supporting domestic surveillance, building public health capacity (education, training, vaccines, new drugs), and supporting research to develop new and more effective vaccines (82). Seven infectious diseases have been targeted by WHO for eradication campaigns:

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▲ Smallpox eradication is estimated to have cost a total of \$300 million; eradication resulted in cost savings in part because ongoing vaccination is no longer needed. In addition, there is the saving of billions of dollars in health care costs and costs related to premature death from the disease itself.

▲ Polio was eliminated from the Americas in the 1980s; transmission is now restricted to the Indian subcontinent and parts of Africa. It is expected that worldwide savings on vaccination costs will be \$1.5 billion, as countries will no longer have to immunize against polio (87).

▲ Efforts to reduce neonatal tetanus that kills babies and mothers are underway.

▲ There are now global efforts to eliminate measles.



Projected Costs of Scaling Up the Response to Reduce the Burden of Disease

Estimates have recently been developed to determine how much financing is needed to scale up the global response to infectious disease. Perhaps the most thorough estimates come from the report on *Improving Health Outcomes of the Poor*, as part of the work of the Commission on Macroeconomics and Health (84). A country- and intervention-based analysis for different scenarios and coverage levels was developed, based on incremental spending for effective priority interventions directed towards the poor; estimates of total costs needed globally by 2015 range from \$40 billion to \$52 billion annually. Such investment is expected to have a powerful impact on reduction of death in childbirth (100,000 fewer deaths), in childhood (between 2 million and 5 million deaths avoided each year by 2015), from TB infection (10 million cumulative deaths), and from prevention of HIV infections (preventing 100 million additional infections by 2015) (84). Interventions were selected for having the greatest potential impact, and they take into account different levels of development, capacity, and need for investment in health system development in order to scale up. These estimates cover the additional resources or incremental costs over what is currently spent on priority services with the greatest potential impact. While most of these interventions are aimed at addressing infectious disease, they also include essential investments in reproductive health and family planning, and access to contraceptives and services such as skilled birth attendance. Minimum financing needs are estimated to be \$30 to \$40 per person per year for essential interventions; actual health spending is considerably lower, at approximately \$13 per person per year in total health expenditures in least-developed countries, or approximately \$24 per person per year in other low-income countries (84). To mobilize resources

for scaling up the response, the Commission calls for additional funding allocated to the health sector by national governments; donor financing to close the financing gap; specific attention to health coverage of the poor in health sector interventions and service delivery; investments in global public goods, such as collection of epidemiological data, surveillance, and research; and coordination between private pharmaceutical industries, governments, donors, and international agencies for essential medicines.

Improvements in Health and Nutrition Contribute to Social Stability

The Importance of Reducing Demographic Stress

Those developing countries that lower fertility rates have the potential to lower their dependency ratio and take advantage of the “demographic gift,” as more working people support fewer non-working people, with greater opportunities for providing better services for all. The “demographic gift” is only possible as a benefit for a brief time period, when the ratio of workers to dependents is high; it provides a window of opportunity to improve the country’s health, education, and other sectors, or the “gift” will be wasted. Countries that are now experiencing high fertility rates will soon have a high proportion of young people who will enter the labor force. To reap the benefits of the “demographic gift,” youth will need to complete

Those developing countries that lower fertility rates have the potential to lower their dependency ratio and take advantage of the “demographic gift,” as more working people support non-working people, with greater opportunities for providing better services for all...



higher levels of education and have access to productive employment opportunities. Continued rapid population growth exacerbates demographic stress, as growth increases pressure on all sectors, including health, education, and the labor market, diminishing prospects of economic and social progress (3). An analysis of potential threats to social stability over the years 2000-2015 cited a series of destabilizing effects that will occur when large populations of youth face high unemployment: many youth will be living in cities, where increasing urbanization may exacerbate pressure on jobs, services, infrastructure, and social supports (19). Low-income developing countries that receive mass migration from people fleeing areas of conflict, disaster, or crisis will be severely constrained to meet the demands of incoming migrants; low-income countries that send migrants abroad will experience an intensified “brain drain” for the next 15 years, as the countries continue to lose talented and trained young people to migration for greater economic opportunities in developed countries (19).

Government actions to develop national policies to support economic development planning in conjunction with lower population growth have proved to be an important means of accelerating demographic transition in countries participating in the Asian economic miracle (49). In Thailand, many factors contributed to fertility decline, including political stability, investment in health, education, and education of girls; government commitment to investments in effective family planning programs resulted in extensive use of contraceptives by married women, which contributed significantly to fertility decline (36). This created savings for families, who could invest more in the smaller number of children, and for society, as fewer children resulted in lower costs for social programs. In 1975, Thailand and the Philippines had similar populations of about 42 million, and similar levels of economic development; after a

successful family planning program was implemented in the 1970s, Thailand in 2003 had much lower poverty rates, better levels of education, more skilled workers, and about 20 million fewer people for whom to provide services than had the Philippines (23). Conclusions are that governmental commitment through sustained support of political, organizational, and financial resources for family planning programs with a health focus over the long-term successfully achieved more of a balance between population size and the country’s ability to provide adequate services for its citizens (69).

Contributions of Health to Stability

Research on the links between health, social stability, and security has been scarce in the past (43). Recently studies have emerged that assess the risk of instability in countries, based on extensive country data over a multiyear period. Country indicators were developed that include demographic stress and poor human development indicators as key contributors to social unrest, violent conflict, and state failure (2). Human development issues of concern include poverty and poor living standards as a fundamental cause of civic strife; lack of health and other vital services leading to decreased popular confidence, political instability, and social unrest; and unmet expectations for improvement in the quality of life leading to increased discontent and civil strife (2). According to one study of the causes of state instability, in 127 cases over a 40-year period ending in 1996, infant mortality provides a good indicator of the overall quality of life in a country, and high infant mortality has a particularly strong correlation with the likelihood of state failure in partial democracies (53). One extensive wide-ranging review of the literature concerning health, foreign policy, and security concluded there has been very limited theoretical and conceptual thinking around these areas, as they have largely developed as separate spheres. There is a weak base of

evidence for causal explanations, and a clear need for a greater understanding of these linkages; current literature is largely narrowly focused on a few select issues that have arisen from current events, which mainly focus on infectious disease (particularly HIV/AIDS) and the impact of biological weapons (43). HIV/AIDS has been proven to deepen poverty in countries severely affected by the disease if measures are not put in place to halt its spread (74).

Promoting the Expansion of Democracy through Health Programs

The links between political institutions and economic and social outcomes are not fully understood (72). But supporting democratic governance to create virtuous cycles of development involves promoting essential elements that contribute to expanded democracy, such as increased pluralism, participation, and accountability (72). In the 1990s, there was tremendous growth in research and discussion on the concept of *social capital* and the way that social interactions between communities and institutions actually shape economic performance; this research indicates that building social cohesion and trust is crucial for economic development (77).

Health programs may contribute to strengthening democracies, particularly when they aim for increasing community participation in health, and establishing a greater role for community involvement in health education and program implementation (43). Many of the central tenets of health policy reform include aspects of promoting improved governance and democracy at local levels, such as elements of political decentralization, integrated service delivery systems, community participation in health, and attention to human rights and reproductive rights. These efforts may potentially contribute to improving democracy

by fostering dialogue between communities and government; equity in health access; community responsibility for strengthening health services and health education; and greater cost-effectiveness and sustainability of health programs (31).

One example of a health program promoting support for democratic institutions comes from a pilot program for community-based prepayment schemes for health insurance in Rwanda. The main focus of the prepayment schemes was on improving equity in access to health care services, improving quality of care, and creating greater financial sustainability for the provision of health services. The schemes were introduced following a devastating civil war and genocide. Findings from a rigorous evaluation of the pilot program led to the conclusion that the program did accomplish its intended objectives (61). Further, the schemes promoted community dialogue and experience with democratic action through open community meetings to discuss and vote on scheme design and management. Once the schemes were operational, community management led to improved governance in the health sector, through regular democratic decision making in general assemblies, introduction of legal tools for governance, and placement of critical health topics into the political agenda of communities. Finally, prepayment schemes strengthened social and civic fabric by providing a means for risk pooling, creating solidarity among communities, and bringing vulnerable groups into the schemes.

Health is Central to Human Development

Increasingly, the concept of *human development* has been promoted in an effort to capture a multidimensional approach to human lives, and to draw attention to the fact that human poverty is larger than income poverty. A number of studies highlighted the idea that human poverty includes many kinds of deprivation, including that of a short and unhealthy life (52). Nobel Prize winner Amartya Sen has examined the interconnectedness between political, economic, and social spheres; he noted the strong evidence that economic and political freedoms actually help to reinforce each other, and that social areas such as health are central to reducing poverty (63). Improving health, as well as education and social protection, must therefore be seen as integral to improving individual opportunities for economic and political participation. In many respects, the efforts to establish the Millennium Development Goals adopted by countries of the world in 2000 incorporate the move towards human development, as they call for multifaceted improvements in health and education status, poverty reduction, better nutrition, greater gender equality, environmental improvements, and a global partnership to ameliorate the conditions in developing countries (71).

Conclusions

- ▲ The importance of investing in health in developing countries as one means of contributing to improved economic development is receiving greater attention in recent research and international studies.
- ▲ Recent work establishes that the contribution of improved health and nutrition to economic development in industrialized countries was underestimated in the past.
- ▲ Disease and disability have a negative effect on economic development, and are major factors in keeping people in poverty; eliminating disease has been shown to have a stimulating effect on economies.
- ▲ Health improvements stimulate economic growth through increased learning and greater education of the labor force, higher labor force participation and improved labor force productivity, rising incomes, and increasing savings and investment.

Recommendations for Additional Research in Health

Additional research is required to improve understanding of the following issues:

- ▲ The contributions of improved health and nutrition to economic growth;
- ▲ The impact of economic policies on health, and the impact of health systems on economies;
- ▲ Health system strengthening and how it affects the design, balance, and implementation of policy and programs that result in better health outcomes for the poor;
- ▲ The catastrophic effects of illness on the poor;
- ▲ Linkages between demographic trends, health, and security;
- ▲ Contributions of health programs to strengthening social cohesion, democracy, stability, and peace.

▲ ▲ ▲



Improving Labor Productivity in the Middle East through Health and Nutrition

To create a highly productive, educated, and healthy society, the Middle East and North Africa region faces substantial challenges in improving the health and nutrition of its population – especially for women and children. Since independence, countries in the region have placed a high value on education as a contributor to economic development as well as a means of establishing national identities. Most countries have achieved universal primary school enrollment, with significant increases in access to secondary education (79). Improved access to education should have a long-term impact on health improvement; as women obtain higher levels of education, they tend to have fewer children, and mothers with higher education levels tend to have children with improved health, nutrition, and preparation for schooling (45). Reduction in the percentages of illiterate women has been shown to have a significant impact on reducing infant mortality (44).

There have been notable achievements in improving health status in the region during the past 30 years, with infant and child mortality rates decreasing in most countries and substantial declines in total fertility rates in a number of countries. The percentage of children immunized against measles and other childhood diseases has increased. However, key challenges to improving health in the region remain. These challenges include addressing: extremely high maternal mortality rates; a high burden of disease and disability, especially for females; high infant and child death rates among rural and urban poor; and widespread chronic undernutrition and related nutritional deficiencies among the poor. Balancing the requirements of addressing poverty in different social groups while maintaining efficiency and equity in health care service delivery will be a major challenge in the coming years (6).

The Challenge of Reducing Maternal Mortality

One key health challenge in most Middle East and North African countries is very high maternal mortality (Table 1). Estimates are that about 18,000 maternal deaths occur in the region each year (3). Fertility rates are quite high by international standards, and countries have rapid population growth rates in comparison to other countries at similar levels of economic and social development in other regions of the world. Further, the decline in fertility rates in the region has slowed in recent years. For cultural reasons, early marriage is still encouraged in the region, resulting in high teenage fertility. For example, teenage fertility rates in some countries, such as in Yemen, Oman, and Libya, are twice the global average; modern contraceptive prevalence rates in these countries are also extremely low (3). The health risks of pregnancy during the teenage years are well established, and are an important contributing factor to high maternal mortality rates in the region. Although it is improving, women in the Middle East and North Africa region have had a relatively low level of education, and this is a contributing factor in high fertility. Countries in the region that have introduced explicit policies to lower fertility and increase access to modern contraceptive methods within the context of maternal health programs and services, as in Tunisia and Egypt, have succeeded in lowering their fertility rates.

Substantial progress in reducing maternal mortality is possible, with a policy and strategy in place to address improving the safety of motherhood. It is well known that reducing maternal mortality can be achieved by increasing the coverage of prenatal care services and by increasing rates of assisted deliveries by skilled attendants, with provision of emergency obstetrical care (42). Lessons from countries that have reduced maternal mortality in widely divergent settings note that a



Table 1: Health and Development Indicators in Select Lower-Middle-Income Countries

Lower-Middle-Income Country	Total Fertility Rate	Contra-ceptive Prevalence Rate	Maternal Mortality Ratio (per 100,000 live births)*	Infant Mortality Rate	School Enrollment, Primary (%net) (2000)	Life Expectancy (2000)	Immunized, Measles (% of children)	GDP per Capita (PPP, US\$) (2001)*
Algeria	2.9	64	140	39	98	71	83	6,090
Egypt	3.16	56	80	35	93	69	97	3,520
Iran	2.56	73	37	35	74	69	96	6,000
Jordan	3.58	53	41	27	...	71	99	3,870
Morocco		50	230	...	78	68	96	3,600
Syrian Arab Republic	3.59	...	110	23	96	70	93	3,280
Tunisia		...	70	...	99	73	92	6,390
West Bank Gaza	5.02	21.08	...	73
China	1.9	84	55	31	...	71	79	4,020
Philippines	3.32	47	170	29	93	70	75	3,840
Thailand	1.82	72	44	24	85	69	94	6,400

Source: World Bank 2003. 2001 estimates except where noted.

* United Nations Development Programme, 2003. Maternal Mortality Ratios are 1985-2001, data for most recent year available.

skilled birth attendant and a functional referral system for dealing with emergencies are the most important factors; facilities that can provide basic and essential obstetric care, including birthing centers that increase the availability of health facilities, are also a common factor in achieving positive impact (42). In the Middle East and North Africa region, particular attention is required to target interventions to reduce maternal mortality to the vulnerable poor, and to address the significant gaps between urban and rural areas in access to and quality of services (4). Attention to expanding the mix of contraceptive methods, improving counseling about contraceptives, and increasing service provider competence to close the gap on unmet need for family planning services are all essential (4).

The Challenge of Reducing Death and Disease among Infants and Children in Vulnerable Populations

There has been significant improvement in reduction of infant and child deaths in the Middle East and North Africa region. Yet large disparities remain among countries and, within countries, between rural and urban areas. The region has world's highest prevalence of short birth intervals, and this continues to be a significant factor in infant mortality in each country; infant mortality is also substantially higher among the unusually high number of teenage mothers (4). Even though mortality has declined, persistent high incidence of infectious disease among the children of the rural poor causes increasing polarization in terms of health

profiles between the rural and urban areas (79). For example, in Egypt, poor children under five are almost four times more likely to die before their fifth birthday than wealthier children; and they are less likely to receive immunizations or be treated for illness (38). Poor children represent a large share of primary and secondary school children in Egypt, and yet poor children are more likely to enroll in school late due to illness and be absent more frequently due to illness – factors that lead to low educational attainment (79).

Reducing infant and child mortality and morbidity in the Middle East and North Africa region is possible, in coordination with efforts to reduce maternal mortality. Effective interventions to prevent or treat major causes of child mortality are known, but renewed action is needed to reach vulnerable populations. Strategies to improve child health will have to be coordinated with strategies to improve maternal health of the poor, to reduce the incidence of low birth weight babies, and reduce maternal death, a factor strongly correlated to reduced survival in infants in the region (3) (Box 3). Addressing the health needs of the poor for access to important preventive services such as immunizations, and effective treatment of child illness through IMCI, will be required to erase disparities in child health. Based on experience to date, transforming knowledge into action will likely demand strong leadership, strengthening health systems to support sustainable approaches to improving child survival and health, along with adequate resources that are targeted to achieve these goals (13).

The Challenge of Addressing Chronic Malnutrition

The prevalence of stunting from chronic malnutrition is so high in the Middle East and North Africa that malnutrition must be addressed as an impediment to economic development. It has been demonstrated that economic development and greater prosperity in countries of the region do not necessarily result in improved nutrition for children; in Egypt and Tunisia, prevalence of stunting of children

Box 3. Recent Estimates of Child Nutrition Issues in the Middle East and North Africa

Recent estimates hold that in the Middle East and North Africa region:

- ▲ In seven countries, over 20 percent of children under five have stunted growth, where attaining normal height for age is hindered by chronic malnutrition;
- ▲ In nine countries, more than 5 percent of children under five suffer from wasting, or below normal weight for height due to acute malnutrition;
- ▲ Over 10 percent of babies in five countries are estimated to have low birth weight due to poor health and nutrition of the mother (data from other countries is unavailable);
- ▲ Among children under five, between 40 and 80 percent are anemic;
- ▲ About 85 million people are at risk for iodine deficiency disorders.

Source: Aoyama, 1999

due to chronic malnutrition actually increased at the same time as overall economic development and GNP per capita increased in each country (79). Specific policy and program approaches are needed to improve the nutritional status of women and children. Although most countries in the region have achieved food security at the country level, with the exceptions of Yemen and Iraq, and nutritional status has improved over the past 20 years, malnutrition remains a major public health problem in all countries (79). The principal problems are low birth weight of babies born to mothers with poor nutritional and health status; chronic undernutrition, leading to stunted growth in children over time; wasting due to acute malnutrition; deficiencies in micronutrients such as iron, iodine, and vitamin D, particularly in poor countries; and widespread anemia in women and children in all countries (79).

There are many reasons for malnutrition in the Middle East and North Africa region. The primary reasons relate to poverty, as it leads to inadequate balance and quality of food eaten on a regular basis, and poor knowledge and behavior among vulnerable groups about child feeding and care practices. The major problems are:

- (1) Poor maternal health and high fertility, with short birth intervals, as contributing factors in low birth weight of infants;
- (2) Poor care and feeding practices, including low rates of exclusive breastfeeding, insufficient complementary feeding as young children are introduced to solid foods at six months to two years of age, and frequent illness from infectious diseases, with poor feeding practices during illness;
- (3) Cultural practices, including widespread consumption by women and children of foods, such as tea and unleavened bread, which inhibit iron absorption; inequities in food distribution to women and children; and vitamin D deficiency due to low dietary intake of vitamin D because of low intake of animal foods, and to low exposure to sunlight (which enables vitamin D to be synthesized by the skin) because of wrapping of infants, women and children wearing thick dark veils, and living in darkened houses;
- (4) Lack of water and sanitation, contributing to widespread illness due to diarrhea and parasite infestation; and
- (5) Lack of comprehensive coverage of salt iodization programs to eliminate iodine deficiencies (3).

Women and children living in rural areas are the most vulnerable, and the urban/rural gap in nutritional status appears to be widening; the situation is further complicated in that, in higher

income and urban areas, obesity is emerging as a problem that will result in increased rates of noncommunicable disease, such as diabetes and hypertension (79).

There is now considerable experience with programs to combat and prevent malnutrition that are applicable for developing an approach in the Middle East and North Africa region. Among these lessons learned are the need for interventions to be feasible and practical, the importance of developing goals, terminologies, and strategies that are simple; the understanding that programs to address malnutrition should be widely promoted, so that the purpose and goals of the effort are widely understood among communities; the need for networking and building of partnerships; and the need to recruit committed leaders to support programs (33). Prevention of nutritional deficiencies is possible through a concerted, combined approach that includes fortification of staple foods with iron and other micronutrients, promotion of more diversified diets, education programs, as well as improved attention to nutrition in health services for women and children. Developing extensive education and communication programs for multiple audiences (mothers, health professionals, community leaders, schools, mass media) with specific nutrition messages to improve widespread knowledge is an important step. Messages should aim to promote more diversified diets and reducing harmful practices, such as feeding tea to young children and consuming tea with meals. These efforts should be developed in collaboration with targeted programs for growth promotion and linked with health services; supplementation and fortification programs must be developed for specific micronutrient deficiencies. Strategies to address prevention and control of malnutrition must be integrated with addressing contributing causes of poor nutrition (such as infectious and parasitic diseases), antenatal care and safe motherhood, family planning and reproductive health, improved child health through IMCI, and improved environmental health (27).



Summary

A sound development approach for improving the productivity of the labor force to contribute to greater economic development in the Middle East and North Africa includes investing in improving the health and nutrition of the poor, along with investment in education and other sectors. Targeted interventions to improve maternal and child health and nutrition will be necessary, along with public awareness and education promoting greater use of maternal-child health care services, family planning, and improved child care and feeding practices. By improving investments in human capital, countries of the region will ensure that children will have a better opportunity to develop their potential, improve their capacity to learn and to achieve in education, and contribute more productively to their country's economic development.

Health Terms

Anemic Refers to the condition of anemia, characterized by a deficiency in red blood cells and hemoglobin in the blood. It causes fatigue in adults, reduces a woman's ability to survive pregnancy and childbirth, and is associated with decreased survival in infants and children.

Infant mortality Refers to the death of a child before reaching the age of one year. A lower rate of infant mortality indicates fewer infant deaths and may indicate an improved level of health care available in a country.

Childhood cluster of diseases refers to pertussis, polio, diphtheria, measles, and tetanus.

Chronic conditions A condition that lasts for a long period of time or is marked by frequent recurrence.

Cognitive development with regard to growth in children's ability to think, solve problems, and conceptualize.

Complementary feeding The addition of other foods in a child's diet other than mother's milk, recommended from the age of six months to two years.

Disease burden The sum significance of disease for society in excess of the immediate cost of treatment.

Fertility reduction Referring to a reduction in the number of births to a mother.

Food security When all people at all times have physical and economic access to the food they need for a productive and healthy life.

Health status The sum of an individual or population's health. Status can be measured by infant mortality, life expectancy at birth, or morbidity.

IMCI Integrated Management of Childhood Illness is an integrated approach to child health that focuses on the well-being of the whole child.

Infectious disease includes all communicable diseases, and some forms of respiratory infections and diarrhoeal diseases.

Iodine deficiency disorder A condition characterized by a critical shortage of iodine, an essential chemical element needed by the human body, especially the brain. Pregnancy complications, brain damage, and child death may result from this disorder.



Low birth weight A birth weight of less than 2.5 kg.

Morbidity The number of cases of certain illnesses per capita during a defined period of time.

Maternal mortality Maternal deaths in a population that result from pregnancy complications and childbirth.

Micronutrients Essential nutrients in the diet required only in very small quantities, e.g., vitamins and minerals.

Psychomotor development The development of both motor and mental abilities in an individual.

Stunted growth The retardation of linear growth, often in a child with malnutrition, and considered indicative of long-term undernutrition.

Wasting malnutrition A condition characterized by the breakdown of body tissue for use as a protein source when the diet does not include enough protein.

Demographic gift An increase in the average age of a (developing) country's population, to where growth of the working-age population outpaces growth of the overall population and produces increased opportunity for economic development through growth in labor supply, savings, and human capital.

Dependents Those who rely on another especially for financial support, often referring to children or the elderly.

Economic development A progressive improvement in a country's economy in connection with technological and social progress.

Economic growth A progressive quantitative expansion of a country's economy, arising either from using more resources or by using fixed resources more efficiently.

Human capital Refers to a country's people and their ability to be economically productive. Health care, training, and education can help increase human capital.

Productivity Output of goods and services per unit of input.

Poverty traps A cycle of poor health, education, and income arising from families' financial inability to invest resources in basic needs and health care.

Savings Income remaining after expenditure and consumption.

Economic Terms

Cost-effectiveness analysis Cost-effectiveness analysis in health compares interventions or programs sharing a common health outcome for a given level of resources to produce maximum health benefit. Cost-effectiveness occurs when inputs are combined so as to minimize the cost of any given output.

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